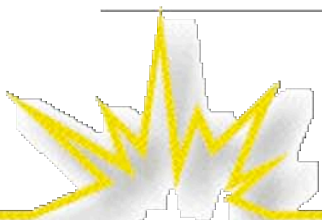


Carbon Management and Green Power Markets-- Avoiding Collateral Damages

National Renewable Energy Marketing Conference

December 4, 2006

Richard Cowart



The Regulatory Assistance Project

50 State Street, Suite 3
Montpelier, Vermont USA 05602
Tel: 802.223.8199
Fax: 802.223.8172

177 Water St.
Gardiner, Maine USA 04345
Tel: 207.582.1135
Fax: 207.582.1176

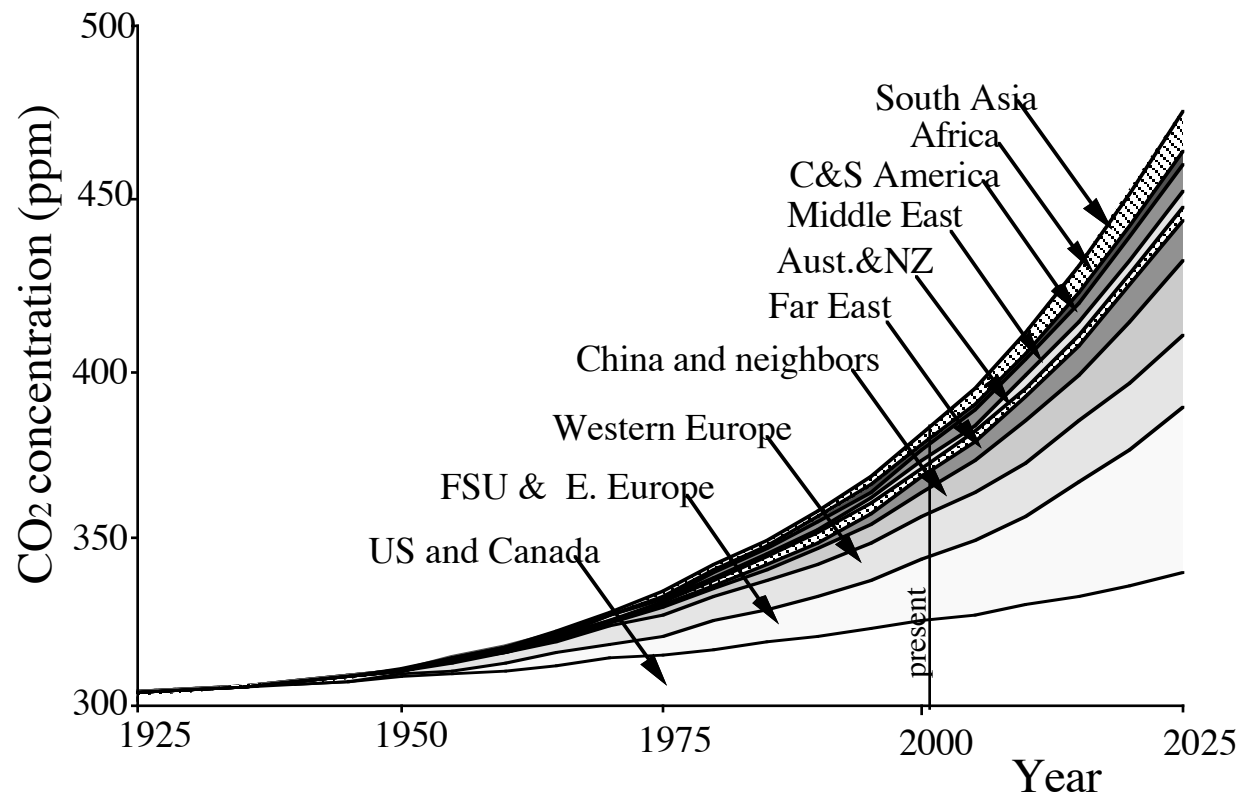
Website:
<http://www.raponline.org>

2 billion villagers want a better life



Why us?

...most of the **CO₂ in the atmosphere** will be from N. America and Europe for years to come.



Explanatory note: Despite rapid increases in the emissions from developing countries such as China that are anticipated in the coming decades, the U.S., Europe and Russia will continue to be the source of most of what is in the atmosphere for many decades because carbon dioxide has a long residence time in the atmosphere. The projections shown assume that the Russian economy recovers and resumes its past practices in energy use.

2006 plans: 154 plants, 93 GW, \$137 billion

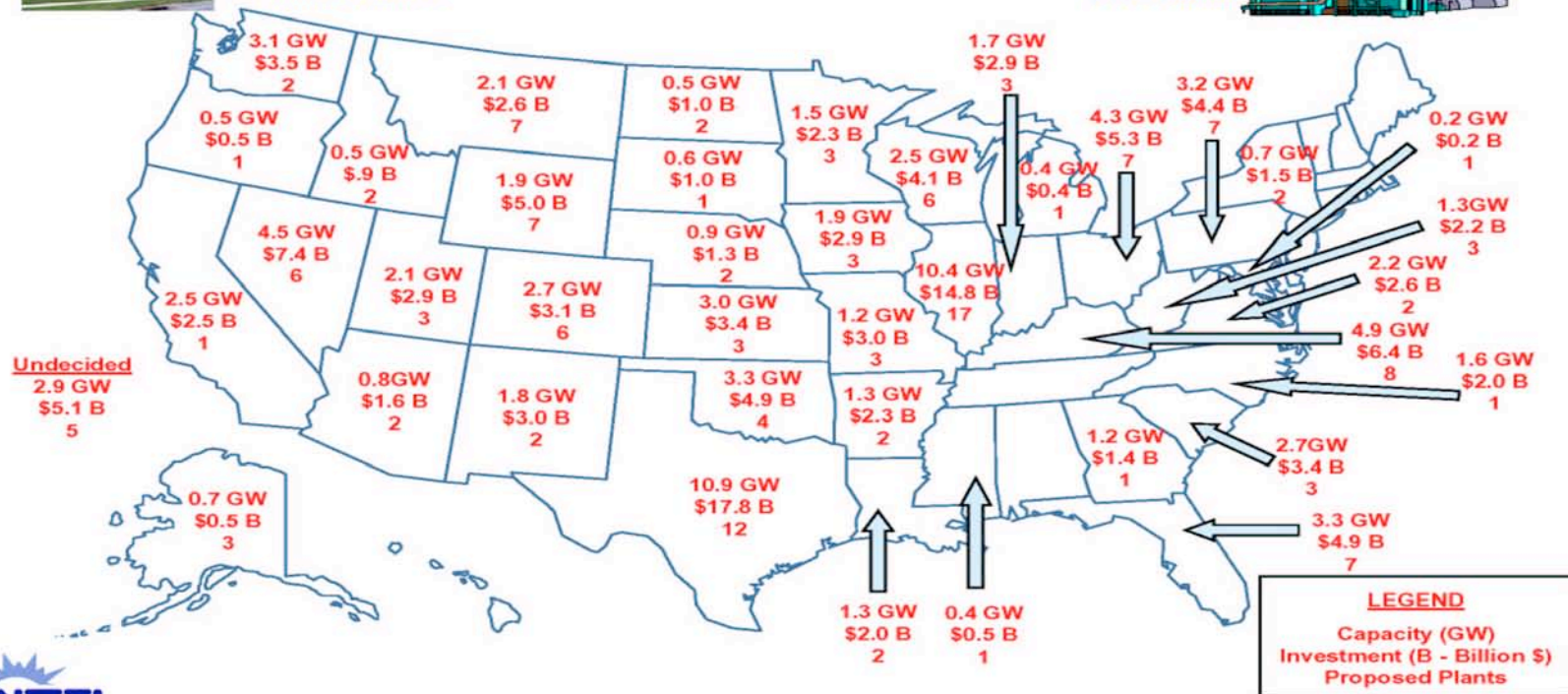
Coal's Resurgence in Electric Power Generation



Equivalent Power
for
93 Million Homes

Proposed New Plants

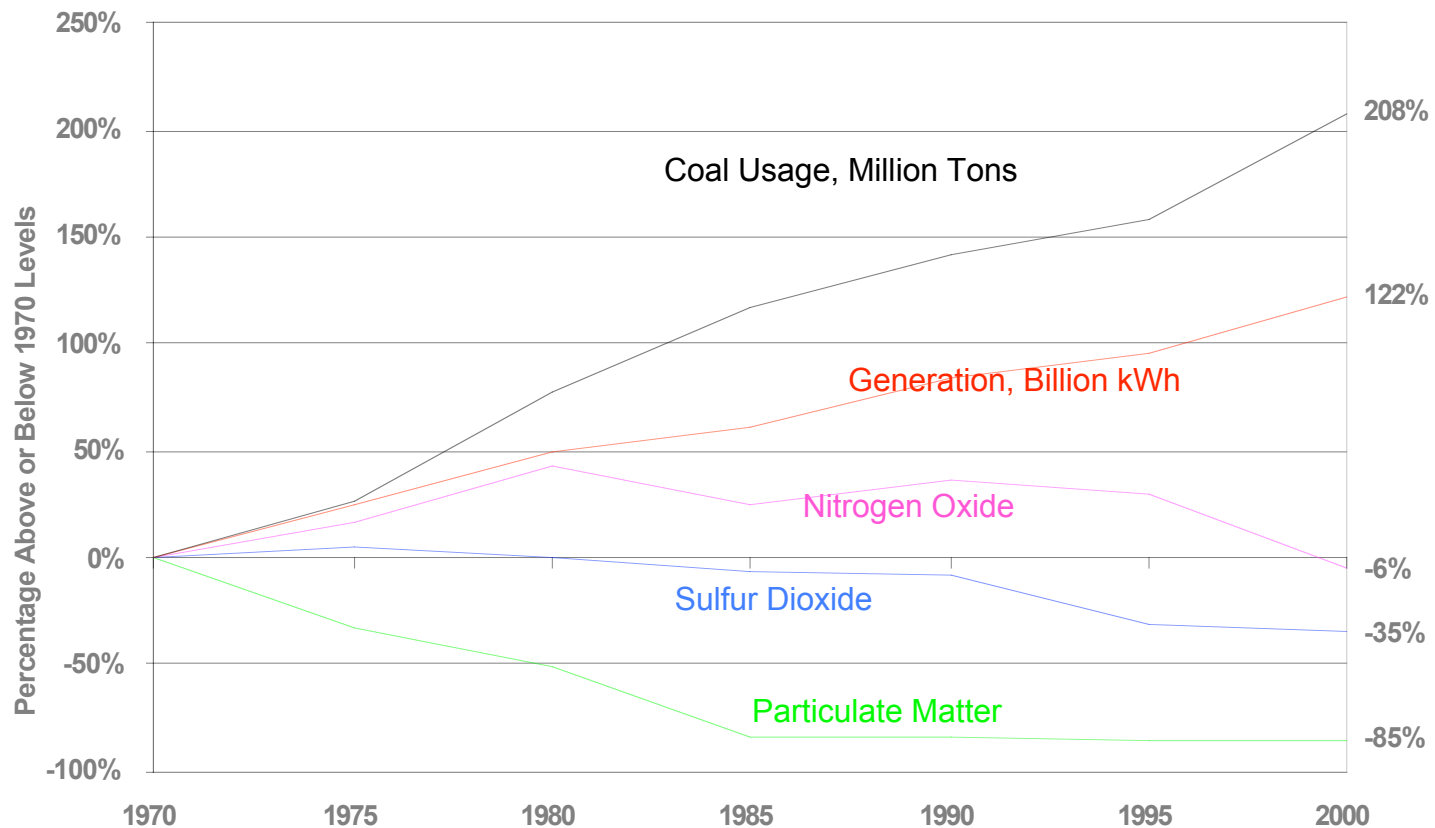
154 Plants
93GW
\$ 137 Billion



NETL Contacts: Scott Klara, klara@netl.doe.gov
Erik Shuster, erik.shuster@sa.netl.doe.gov

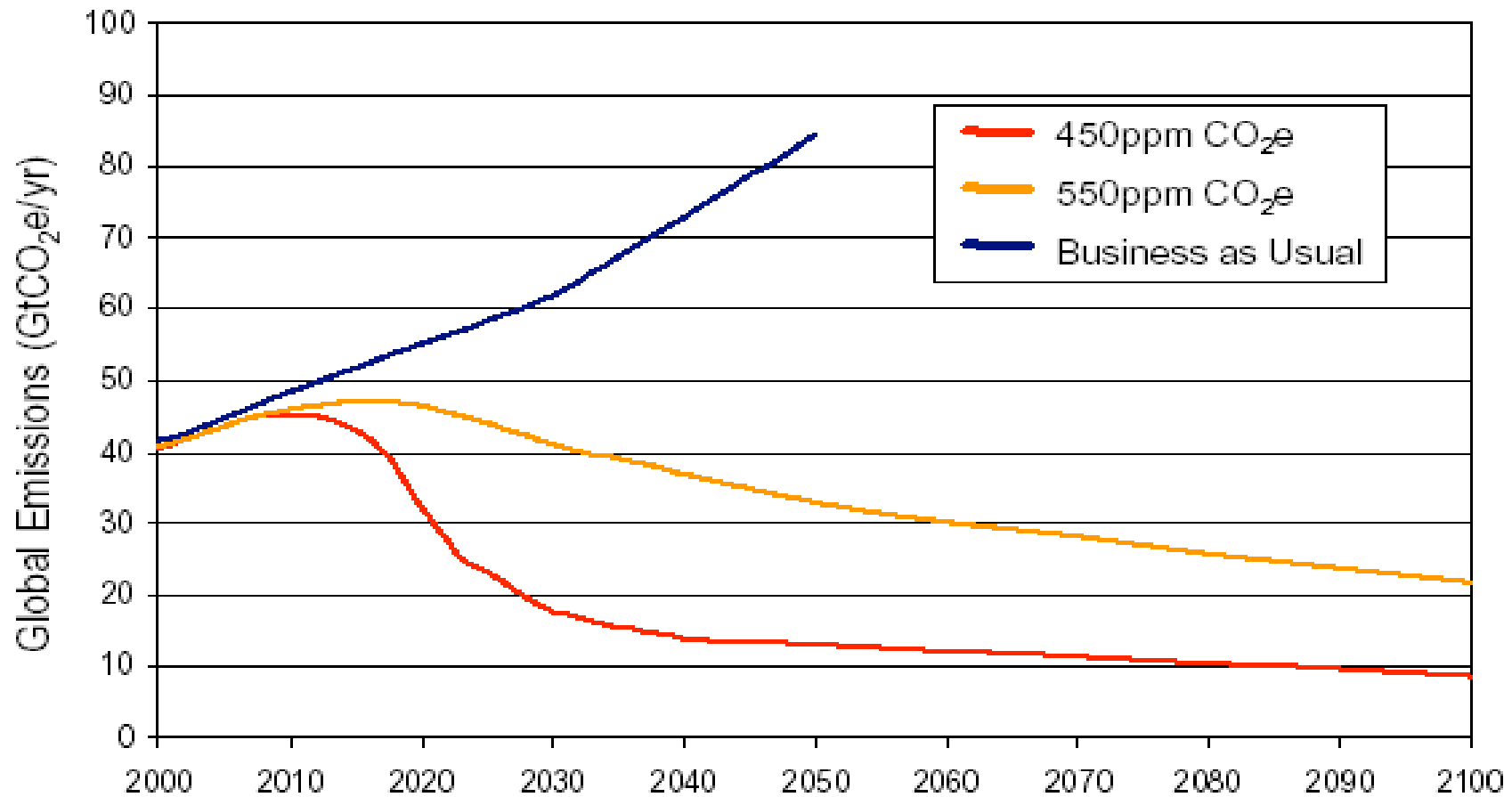
OCES 9/29/2006

Emissions from Coal Generation Decreased by 1/3 While Coal Use Tripled (but which line is carbon?)



Source: U.S. EPA and Energy Information Administration.

Emission paths to stabilization



Source: Stern Review (UK) October 2006



Three carbon pollution programs in design stages now:

1. Cap and trade – generator-based
 - ❖ RGGI: 7 to 10 Northeastern states
2. Cap and trade – load-based
 - ❖ California PUC & Oregon CATF
3. Emissions performance standard (EPS)
 - ❖ California PUC Rule & SB 1368

Focus today is on the effects of these carbon pollution programs on renewable marketing claims, and thus on voluntary green power markets

Can we avoid unintended negative effects?

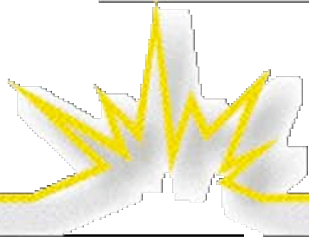
State and regional power sector carbon caps

California
& Oregon



Together, their
carbon profiles
exceed most nations.

RGGI -
7 to 10
states



What is cap-and-trade?

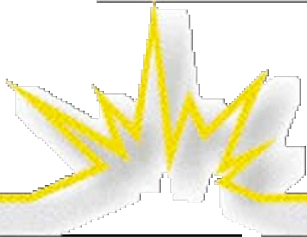
- Set a fixed limit on OVERALL emissions, not each single source, declining over time.
- Create a new kind of currency (tradable allowances) for quantities of emissions.
 - ❖ “Carbon credits are just another form of money”
- Require emitters (or consumers) to retire allowances to match “their” emissions in each time period.
- Sell or give out allowances
- Permit trades in an allowance market
- Examples: US acid rain and NOx programs

The Northeast Regional Greenhouse Gas Initiative (RGGI)



- 7 states now in
- 3 other states likely to join (MA, RI, MD)
- MOU signed by 7 Governors 12/05
- Model Rule now approved
- State-by-state adoption 2007+
- Launch 2009
- Cap, reduce 10% by 2019

Setting 1. Renewables and RGGI



(A) The renewables base:

1. RGGI carbon **baseline** includes **historic** renewables
2. RGGI regional **cap structure** assumes all **new RPS renewables** will be delivered as promised
 - ❖ Thus, these have a general effect of lowering the cap, but not in an explicit “creditable” fashion.

(B) Voluntary green markets:

- ❖ In RGGI-7 states, green markets are ~750,000 MWh/year and growing
- ❖ Equals 6% to 12% of the average annual reductions proposed by RGGI-7 (2009-2019)

Carbon cap accounting: two principles

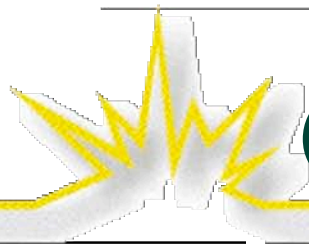


(1) Even highly beneficial “on-system” actions don’t lower emissions

- ❖ Examples: EE, RE within RGGI states
- ❖ Why? Unused credits are tradable for use by others

(2) Offsets for “off-system” carbon savings must meet rigorous standards

- ❖ RSVP+E = Real, Surplus (or Additional), Verifiable, Permanent, and Enforceable



Green markets and RGGI

- **Problem:** Under a cap, reductions in emissions in one area can be sold to support increases elsewhere
 - ❖ Thus, NO CARBON CLAIM could be made for green sales within RGGI states*
 - ❖ But voluntary sales ARE an important carbon strategy
- **Solution:** Voluntary green sales have to lower allowed emissions – i.e., lower the cap. Options:
 - ❖ Green market set-aside – awards to green power marketers directly
 - ❖ “Take it off the top” – reduce cap by projected green sales
 - ❖ Green market true-up: accelerate the cap decline after green sales
- **Status:** no mandate yet in RGGI MOU or Model Rule
 - ❖ Individual state rules will be needed

**(possible unfortunate exception: if RGGI fails to control leakage, and the sale demonstrably lowers fossil power imports, then perhaps the claim is valid)*

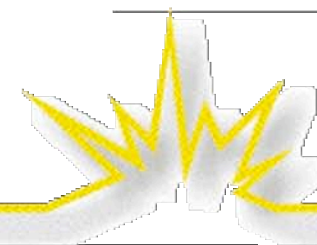
Setting 2. West-coast system:

Load-Side Cap and Trade

Basic rule: LSEs must have credits to cover the emissions associated with their sales to retail customers? Steps:

1. Measure historic emissions associated with electricity *serving the state* (or region) –
 - ❖ All sources, wherever located -- both in-state and imports
2. Set “hard” emissions caps to lower impact in stages
3. Distribute allowances (“carbon credits”) to LSEs
4. LSEs spend credits as needed to match their portfolio of sources
 - can sell excess credits from RE & EE choices
5. NOTE: load-side cap & trade includes all power – local and remote -- eliminates “leakage” so cap claims are more accurate.

Renewables under load-side cap and trade

- 
- Baseline and RPS renewables can lower the cap, but no rigorous proof that they have done so
 - The carbon value of all renewables is automatically flowed through to LSEs
 - ❖ Good: adds value to RE directly to the RE LSE
 - ❖ Problem: they can sell the released credits
 - Voluntary green markets –
 - ❖ Carbon claims require an explicit cap reduction

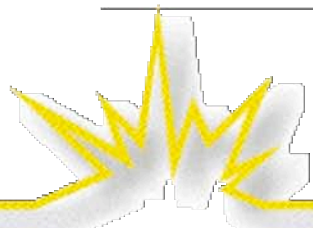
Green markets and load-side caps

➤ Possible solutions:

- ❖ **Green market set-aside:** credits awarded to green marketers or generators (for retirement)
- ❖ **Take it off the top:** reduce the cap generally to reflect anticipated green market sales
- ❖ **Green market true-up:** reduce cap in future compliance periods

➤ Details:

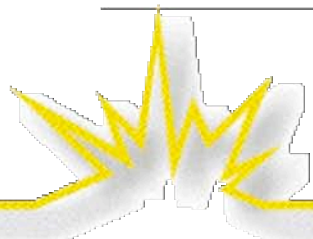
- ❖ Out of which pool? Statewide? Or taken from the customers' local LSEs?
- ❖ Carbon calculation: how much CO₂ was avoided?
 - ◆ System average, Fossil system average, Marginal generation



Setting 3: California EPS

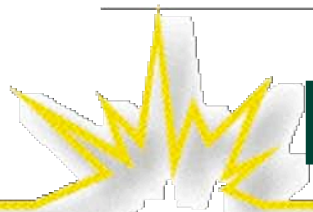
➤ EPS: Emissions *Performance* Standard

- ❖ A case-by-case, “go/no-go” standard for new financial commitments by CA LSEs
- ❖ NOT an Emissions Portfolio Standard (blend rate for everything in the LSE mix)
- ❖ Rulemaking under way at CA PUC, now with legislative direction (SB 1368)
- ❖ Avoids “race to grandfather” and “backsliding” while statewide cap is designed



California EPS Elements

- Focus is new commitments
- All LSEs are covered: IOUs, POUUs, ESPs
- “Gateway” standard – one time review
- Governs all **new, major, long term, baseload** commitments
 - ❖ Triggers: 5 years, 25MW, >60% cap factor
 - ❖ Buy, Build, Renew, Repower – all covered
 - ❖ Geographic neutrality (in-state & out are same)
- Standard: emissions rate of combined cycle natural gas generator or better (staff Report: 1100 pounds/MWh)



Renewables and the EPS

➤ Generally:

- ❖ Renewable power meets the EPS on a *net life-cycle basis*
- ❖ EPS is not a cap, so voluntary green market claims are still valid
- ❖ Still must avoid double counting RPS power

➤ Thorny problem: **null power**

- ❖ Q: If RECs are sold to “cover” fossil power, what is left behind? Does it qualify under the EPS?
- ❖ One possibility: look only at the underlying facilities (RECs can’t cover a fossil plant for the EPS rule)
- ❖ Leading answer: allow sale of RECs, but treat null power as system power
- ❖ Avoids double-counting or splitting the environmental attributes of REC power



Extra credit: What about offsets for green markets?

- Offsets defined
- What about green market purchases on remote, uncapped systems?
 - ❖ On an uncapped system, additional green generation DOES lower emissions, BUT
 - ❖ Any **green markets** offset credits must be retired UNUSED (therefore not really an offset)
- Policy tug-of-war:
 - ❖ Promotes green power in uncapped regions; but
 - ❖ Gives financial reward for failure to cap, and
 - ❖ Ultimately, power gen should be capped nation-wide
- RGGI: no offsets earned for remote renewables



For more information...

“Another Option for Power Sector Carbon Cap and Trade Systems – Allocating to Load”

“Addressing Leakage in a Cap-and-Trade System: Treating Imports as a Source”

“Why Carbon Allocation Matters – Issues for Energy Regulators”

Richard Cowart, Regulatory Assistance Project

Posted at www.raonline.org

Email questions to RAPCowart@aol.com

